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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,307	07/11/2001	Michael R. Sogard	PA0272-US/11269.30	1029

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EXAMINER

NGUYEN, LAM S

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 05/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/903,307

Applicant(s)

SOGARD ET AL.

Examiner

LAM S NGUYEN

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 and 38-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36, 38-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-4, 6, 8-11, 13, 16, 18-21, 22, 25-27, 30, 32-35, 36-37, 40-44, 47, 49-68 are rejected under 35 U.S.C. 102(b) as being anticipated by Sogard et al. (US 5552888).

Sogard et al. disclose a stage assembly that moves a device along a Y axis, the stage assembly comprising:

Referring to claims 1, 22, 36, 61, 66:

a device stage that retains the device (FIG. 9A, element 900);

a stage mover assembly connected to the device stage, the stage mover assembly moving the device stage along the Y axis (FIG. 9A, elements 910, 912 and column 7, lines 25-28: a coil 910/912 forms part of a linear drive motor for moving stage in X/Y direction); and

a first follower frame that supports the device stage along a Z axis (**Referring to claim 22**), the first follower frame being moved substantially concurrently with and to substantially follow the movement of the device stage along the Y axis (FIG. 9A-B, element 944 or 946 and FIG. 10C: the stage 900 and the follower frames (944, 946) move concurrently).

Referring to claim 61: a mover connected to the frame, wherein the mover moves the frame along the axis at substantially the same time that the stage mover assembly moves the device stage along the axis (Fig. 10A-10D and column 7, line 49 to column 8, line 9: "A drive

mechanism (not shown) moves the Y follower in the Y direction” and “follower Y 1020 moves in the Y direction to closely follow stage 900 as it travels in the Y direction”).

Referring to claims 2, 37: wherein the stage mover assembly moves the device stage along an X axis relative to the first follower frame (FIG. 10A-B).

Referring to claim 3: further comprising a first follower mover that moves the first follower frame along the Y axis (column 7, lines 49-59: A drive mechanism moves the Y/X follower in the Y/X direction).

Referring to claim 4: wherein the first follower mover moves the first follower frame along the Y axis substantially concurrently as the stage mover assembly moves the device stage along the Y axis (FIG. 10A, 10C, 10D).

Referring to claim 6: further comprising a first follower guide (FIG. 9B, element 962) that supports the first follower frame.

Referring to claims 8, 40: wherein the first follower frame supports the device stage near a first table side of the device stage (FIG. 9A-9B: the follower frame 946 supports one side of the stage 900 and the follower frame 944 supports the other side of the stage 900).

Referring to claims 9, 25, 41: further comprising a second follower frame that supports the device stage along the Z axis, the second follower frame moving along the Y axis (FIG. 9A-9B, either element 944 or 946).

Referring to claims 10, 25, 42: wherein the first follower frame and the second follower frame are moved substantially concurrently, with the device stage along the Y axis (FIG. 10A, 10C, 10D).

Referring to claims 11, 26, 43: wherein the first follower frame supports the device stage near a first table side of the device stage and the second follower frame supports the device stage near a second table side of the device stage (FIG. 9A-9B: the follower frame 946 supports one side of the stage 900 and the follower frame 944 supports the other side of the stage 900).

Referring to claims 19, 33, 50, 65, 68: an exposure apparatus including the stage assembly of claim 1, 61, or 66 (FIG. 1).

Referring to claims 20, 34, 52: a device manufactured with the exposure apparatus according to claim 19 (FIG. 1, element 100).

Referring to claims 21, 35, 51: a wafer on which an image has been formed by the exposure apparatus of claim 19 (FIG. 1, element 100).

Referring to claims 13, 27, 44: wherein the first follower frame and the second follower frame support the device stage in a kinematic manner (FIG. 9A-9B and 10A-10D).

Referring to claim 16, 18, 30, 32, 47, 49: further comprising a line that is connected to the device stage, the line being secured to the first follower frame wherein the line carries electrical current (FIG. 9A: element 910 and 912 are coils, which are used to form the linear motors, carrying electrical current when the linear motor is operating).

Referring to claims 53, 58, 62: wherein the first follower mover moves the first follower frame along the Y axis to substantially track the movement of the device stage by the stage mover assembly along the Y axis (FIG. 10C-10D and column 8, lines 2-9).

Referring to claims 54, 56-57, 59, 63, 66: wherein the first follower mover does not direct a force that acts on the device stage (column 7, lines 49-57 and FIG. 9A-9B: The drive mechanism, such as drive motor, directly applies a force to only drive the followers).

Referring to claims 55, 60, 64, 67: wherein the stage mover assembly does not direct a force that acts on the first follower frame (column 7, lines 60-64: Because the linear-motor coils of stage 900 do not physical contact the followers, the stage mover - the linear motor – does not directly apply a force to the follower).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 5, 17, 23, 31, 38, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sogard et al. (US 5552888) in view of Sugishima et al. (US 4684315).

Sogard et al. disclose the claimed invention as discussed above except wherein the first follower frame includes a stage channel for receiving a portion of the device stage and a pair of opposed stage fluid bearings that support the device stage relative to the stage channel and allow device stage to move along an X axis relative to the first follower frame (**Referring to claims 5, 23, 38**) and wherein the line provides fluid to the device stage (**Referring to claims 17, 31, 48**).

Sugishima et al. disclose a frictionless supporting apparatus having a pair of opposed stage fluid bearings (FIG. 2, elements 11-12) to form a frame including a channel (FIG. 2: the space between the upper and lower element 11 and 12) for receiving a portion of a device stage (FIG. 2, element 3) and to support the movement of the device stage and a line providing fluid to the device stage (FIG. 2: a corresponding line provides N2 to the inlet 10).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the stage assembly disclosed by Sogard et al. such that including a stage channel for receiving a portion of the device stage and pairs of opposed stage fluid bearings that support the device stage relative to the stage channel as disclosed by Sugishima et al. The motivation of doing so is to achieve a frictionless supporting to a moving working table as taught by Sugishima et al. (column 3, line 60-65).

3. Claims 7, 12, 24, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sogard et al. (US 5552888) in view of Lee (US 6008500).

Sogard et al. disclose the claimed invention as discussed above except a first pair of opposed, guide fluid bearings and a second pair of opposed, guide fluid bearings that support the first follower frame relative to the first follower guide along an X axis and along a Z axis and allow for movement of the first follower frame relative to the first follower guide along the Y axis (**Referring to claim 7, 24, 39**) and wherein the stage mover assembly includes a first Y stage mover and a second Y stage mover, and the follower frames are positioned between the first Y stage mover and the second Y stage mover (**Referring to claim 12**).

Lee discloses a guided stage mechanism including a stage movable in the X-Y directions on a base (FIG. 1, element 10), follower frames (FIG. 1, elements 40A-40B) each moves relative to a corresponding fixed guide (FIG. 1, elements 46A-46B) and is supported by a corresponding pair of opposed, guide fluid bearings (FIG. 1, elements 50A-50B and 52A-52B) relative to the fixed guide, wherein the follower frames are positioned between a first and second stage movers (FIG. 1, elements 60A-60B).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the stage assembly disclosed by Sogard et al. such that including pairs of opposed, guide fluid bearings to support the follower frame relative to the follower guide as disclosed by Lee. The motivation of doing so is to minimize friction between the frame guide member and its fixed guide as taught by Lee (column 4, lines 52-53).

4. Claims 14-15, 28-29, and 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sogard et al. (US 5552888) in view of Loopstra et al. (US 5969441).

Sogard et al. disclose the claimed invention as discussed above except wherein the device stage includes a first table section and a second table section that is movable relative to the first table section to separate the device stage (**Referring to claim 14, 28, 45**) and wherein each of the table sections retains at least one device (**Referring to claim 15, 29, 46**).

Loopstra et al. disclose a lithographic device having a device stage including a first table section (FIG. 3, element 13) and a second table section (FIG. 3, element 11), wherein both are movable relative to each other and each retains one semiconductor substrate (column 11, lines 13-23).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the stage assembly disclosed by Sogard et al. such that the device stage includes a first table section and a second table section that is movable relative to the first table section to separate the device stage as disclosed by Loopstra et al. The motivation of doing so is to achieve a considerable increase in the manufacturing output compared with a lithographic device having only one substrate holder as taught by Loopstra et al. (column 11, lines 50-53).

Response to Arguments

Applicant's arguments with respect to claims 1, 22, and 36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
May 7, 2004



HAI PHAM
PRIMARY EXAMINER